

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

### LISTING OF CLAIMS

1. (Original) A method of operating a computer system, said method comprising:
- providing a first version of a program in memory, said first version of a program including at least one program unit, each program unit comprising an Application Programming Interface (API) definition file and an implementation, each API definition file defining items in its associated program unit that are made accessible to one or more other program units, each implementation including executable code corresponding to said API definition file, said executable code including type specific instructions and data; and
- performing a first verification including verifying said program prior to execution of said program, said first verification including
- indicating a verification error when a first version of a first program unit implementation is not internally consistent;
- indicating a verification error when said first version of said first program unit implementation is inconsistent with a first version of said first program unit API definition file associated with said first version of said first program unit implementation;
- receiving a second version of said first program unit implementation and a second version of said first program unit API definition file, said second version being a revised version

of said first version;  
performing a second verification including verifying said second version of said first  
program unit implementation, including  
indicating a verification error when said second version of said first program unit  
implementation is not internally consistent; and  
indicating a verification error when said second version of said first program unit  
implementation is inconsistent with said second version of said first program unit API  
definition file; and  
performing a third verification including verifying said second version of said first program  
unit implementation is binary compatible with said first version of said first program  
unit implementation by comparing said first version of said first program unit API  
definition file and said second version of said first program unit API definition file.

2. (Original) The method of claim 1, further comprising:

indicating a verification error when a second program unit implementation that references  
said first program unit is inconsistent with said first version of said first program unit  
API definition file; and  
indicating said second program unit implementation is verified with said second version of  
said first program unit API definition file when said second version of said first  
program unit binary is compatible with said first version of said first program unit  
implementation.

3. (Original) The method of claim 2, further comprising:

indicating said second program unit implementation is verified with said second version of said first program unit implementation when said second program unit implementation is verified with said second version of said first program unit API definition file.

4. (Original) The method of claim 1 wherein said first version of said first program unit API definition file is binary compatible with said second version of said first program unit API definition file when said second version of said first program unit API definition file includes a superset of each element in said first version of said first program unit API definition file.

5. (Original) The method of claim 1 wherein said first program unit references items in at least one other program unit; and said second verification includes indicating a verification error when said second version of said first program unit implementation is inconsistent with API definition files of each referenced program unit.

6. (Original) A program storage device readable by a machine, embodying a program of instructions executable by the machine to perform program verification, comprising: providing a first version of a program in memory, said first version of a program including at least one program unit, each program unit comprising an Application Programming Interface (API) definition file and an implementation, each API definition file defining

items in its associated program unit that are made accessible to one or more other  
program units, each implementation including executable code corresponding to said  
API definition file, said executable code including type specific instructions and data;  
and  
performing a first verification including verifying said program prior to execution of said  
program, said first verification including  
indicating a verification error when a first version of a first program unit implementation is  
not internally consistent;  
indicating a verification error when said first version of said first program unit  
implementation is inconsistent with a first version of said first program unit API  
definition file associated with said first version of said first program unit  
implementation;  
receiving a second version of said first program unit implementation and a second version of  
said first program unit API definition file, said second version being a revised version  
of said first version;  
performing a second verification including verifying said second version of said first  
program unit implementation, including  
indicating a verification error when said second version of said first program unit  
implementation is not internally consistent; and  
indicating a verification error when said second version of said first program unit  
implementation is inconsistent with said second version of said first program unit API  
definition file; and

performing a third verification including verifying said second version of said first program unit implementation is binary compatible with said first version of said first program unit implementation by comparing said first version of said first program unit API definition file and said second version of said first program unit API definition file.

AC 7. (Original)- The program storage device of claim <sup>6</sup>~~1~~, further comprising:

indicating a verification error when a second program unit implementation that references said first program unit is inconsistent with said first version of said first program unit API definition file; and

indicating said second program unit implementation is verified with said second version of said first program unit API definition file when said second version of said first program unit binary is compatible with said first version of said first program unit implementation.

8. (Currently Amended) The program storage device of ~~claim 2~~ claim 7, further comprising:

indicating said second program unit implementation is verified with said second version of said first program unit implementation when said second program unit implementation is verified with said second version of said first program unit API definition file.

C 9. (Original) The program storage device of claim <sup>6</sup>~~1~~ wherein said first version of said first program unit API definition file is binary compatible with said second version of said first program unit API definition file when said second version of said first program unit API

definition file includes a superset of each element in said first version of said first program unit API definition file.

10. (Original) The program storage device of claim 6 wherein  
said first program unit references items in at least one other program unit; and  
said second verification includes indicating a verification error when said second version of  
said first program unit implementation is inconsistent with API definition files of each  
referenced program unit.

11. (Original) A system for executing a software application, the system comprising:  
a computing system that generates executable code, comprising means for providing a first  
version of a program in memory, said first version of a program including at least one  
program unit, each program unit comprising an Application Programming Interface  
(API) definition file and an implementation, each API definition file defining items in  
its associated program unit that are made accessible to one or more other program units,  
each implementation including executable code corresponding to said API definition  
file, said executable code including type specific instructions and data; and  
means for performing a first verification including verifying said program prior to execution  
of said program, said first verification including  
means for indicating a verification error when a first version of a first program unit  
implementation is not internally consistent;  
means for indicating a verification error when said first version of said first program unit

implementation is inconsistent with a first version of said first program unit API  
definition file associated with said first version of said first program unit  
implementation;

means for receiving a second version of said first program unit implementation and a second  
version of said first program unit API definition file, said second version being a  
revised version of said first version;

means for performing a second verification including verifying said second version of said  
first program unit implementation, including

means for indicating a verification error when said second version of said first program unit  
implementation is not internally consistent; and

means for indicating a verification error when said second version of said first program unit  
implementation is inconsistent with said second version of said first program unit API  
definition file; and

means for performing a third verification including verifying said second version of said  
first program unit implementation is binary compatible with said first version of said  
first program unit implementation by comparing said first version of said first program  
unit API definition file and said second version of said first program unit API definition  
file.

12. (Original) The system of claim 11, further comprising:

means for indicating a verification error when a second program unit implementation that  
references said first program unit is inconsistent with said first version of said first

program unit API definition file; and  
means for indicating said second program unit implementation is verified with said second version of said first program unit API definition file when said second version of said first program unit binary is compatible with said first version of said first program unit implementation.

13. (Original) The system of claim 12, further comprising:

means for indicating said second program unit implementation is verified with said second version of said first program unit implementation when said second program unit implementation is verified with said second version of said first program unit API definition file.

14. (Original) The system of claim 11 wherein said first version of said first program unit API definition file is binary compatible with said second version of said first program unit API definition file when said second version of said first program unit API definition file includes a superset of each element in said first version of said first program unit API definition file.

15. (Original) The system of claim 11 wherein

said first program unit references items in at least one other program unit; and  
said second verification includes means for indicating a verification error when said second version of said first program unit implementation is inconsistent with API definition



files of each referenced program unit.

16. (Currently Amended) A resource-constrained device, comprising:

memory for providing a remotely verified application software program ~~comprising at least one program unit, each program unit comprising type specific instructions and data, said remote verification utilizing an Application Programming Interface (API) definition file for each said implementation, each said API definition file defining items in its associated program unit that are made accessible to one or more other program units including at least one program unit, each program unit comprising an Application Programming Interface (API) definition file and an implementation, each API definition file defining items in its associated program unit that are made accessible to one or more other program units, each implementation including executable code corresponding to said API definition file, said executable code including type specific instructions and data, said remote verification including verifying a second version of a first program unit implementation is binary compatible with a first version of said first program unit implementation by comparing said first version of said first program unit API definition file and said second version of said first program unit API definition file;~~  
and  
a virtual machine that is capable of executing instructions included within said application software program.

17. (Original) The resource-constrained device of claim 16 wherein said resource-constrained

device comprises a smart card.

18. (Original) The resource-constrained device of claim 17 wherein said virtual machine is Java Card™-compliant.

19. (New) A program storage device readable by a machine, embodying a program of instructions executable by the machine to perform program verification, comprising:  
providing a first version of a program in memory, said first version of a program including at least one program unit, each program unit comprising an Application Programming Interface (API) definition file and an implementation, each API definition file defining items in its associated program unit that are made accessible to one or more other program units, each implementation including executable code corresponding to said API definition file, said executable code including type specific instructions and data;  
and  
performing a first verification including verifying said program prior to execution of said program, said first verification including  
indicating a verification error when a first version of a first program unit implementation is not internally consistent;  
indicating a verification error when said first version of said first program unit implementation is inconsistent with a first version of said first program unit API definition file associated with said first version of said first program unit implementation;

receiving a second version of said first program unit implementation and a second version of said first program unit API definition file, said second version being a revised version of said first version;

performing a second verification including verifying said second version of said first program unit implementation, including

indicating a verification error when said second version of said first program unit implementation is not internally consistent; and

indicating a verification error when said second version of said first program unit implementation is inconsistent with said second version of said first program unit API definition file; and

performing a third verification including verifying said second version of said first program unit implementation is binary compatible with said first version of said first program unit implementation by comparing said first version of said first program unit API definition file and said second version of said first program unit API definition file;

indicating a verification error when a second program unit implementation that references said first program unit is inconsistent with said first version of said first program unit API definition file;

indicating said second program unit implementation is verified with said second version of said first program unit API definition file when said second version of said first program unit binary is compatible with said first version of said first program unit implementation; and

indicating said second program unit implementation is verified with said second version of

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said first program unit implementation when said second program unit implementation  
is verified with said second version of said first program unit API definition file.

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